

Recent Records of the Introduction of Beneficial Insects into the Hawaiian Islands

(Presented at the meeting of September 1, 1938)

At the meeting of June 2, 1938, a Committee of the following members was appointed for the purpose of "recording purposeful introductions into the Territory, of insects and other invertebrates": O. H. Swezey (Chairman), Experiment Station, H.S.P.A.; D. T. Fullaway, Territorial Board of Agriculture and Forestry; A. C. Mason, Bureau of Entomology, U.S.D.A.; F. G. Holdaway, University of Hawaii; K. Sakimura, Experiment Station, P.P.C.A. The following is the report of this Committee:

A list of introduced beneficial insects was published in the "Proceedings of the Hawaiian Entomological Society," V, pp. 299-304, 1923, under the title: "Records of introduction of beneficial insects into the Hawaiian Islands." This was an effort to list all for which records could be found of introductions up to that time.

In October, 1925, this list was printed in "The Hawaiian Planters' Record," XXIX, pp. 369-376, with a few additions, and supplemented with a list of introductions which had been attempted and failed, or at any rate up to that time not yet known to have become established. A revised "reprint" of this list was issued in 1929, bringing it up to date. This revised "reprint" was included in a book by Dr. F. X. Williams: "Handbook of the Insects and Other Invertebrates of Hawaiian Sugar Cane Fields," on pages 368-377, 1931.

There has been considerable activity in insect introduction since that time, by several institutions as the Experiment Station, H.S.P.A., Experiment Station, P.P.C.A., Territorial Board of Agriculture and Forestry and the U. S. Bureau of Entomology and Plant Quarantine. It is well that these various recent introductions should be segregated and recorded. An attempt is made to list all introductions whether they are known to have become established or not. If any of these introduced insects are recovered in the future, it will be a convenience to refer to this list for dates, etc., of their introductions. Some of them have not yet been specifically identified. In the lists, those marked with an asterisk, are not yet known to have become established, *i.e.*, they have not been recovered in the field.

Records from the files of the Experiment Station, H.S.P.A.

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|-------------------------------------|-------------------|--|
| 1929. * <i>Megarhinus inornatus</i> | From New Britain. | Predacious mosquito. |
| Walker. | | |
| 1930. <i>Anagyrus saccharicola</i> | From Philippines. | Parasite of <i>Tri-onymus sacchari</i> . |
| Timberlake. | | |
| 1930. *Small coccinellid: | " " | Predator on <i>Tri-onymus sacchari</i> . |
| <i>Pullus</i> sp. | | |

1930. <i>Scymnus binotulatus</i> (?)	" "	Predator of <i>Trionymus sacchari</i> .
1930-31. <i>Scelio pambertoni</i> Timberlake.	From Federated Malay States.	Egg-parasite of <i>Oxya chinensis</i> .
1930-31. * <i>Scelio serdangensis</i> Timberlake.	From Federated Malay States.	Egg-parasite of <i>Oxya chinensis</i> .
1931. * <i>Pullus apiciflavus</i> (Motsch.)	From Federated Malay States.	Predator on <i>Trionymus sacchari</i> .
1934. <i>Elis pulchra</i> Cameron.	From Guatemala.	Parasite on root grubs.
1934. * <i>Elis</i> near <i>ornaticeps</i>	" "	Parasite on root grubs.
1934. * <i>Elis</i> near <i>flaviceps</i>	" "	Parasite on root grubs.
1934. * <i>Campsomeris</i> near <i>histerae</i>	" "	Parasite on root grubs.
1934. * <i>Tiphia</i> , 2 or 3 species.	" "	Parasite on root grubs.
1934. * <i>Pyrophorus bellamyi</i> Van Zwaluwenburg.	" "	Predator on root grubs.
1934. * <i>Eumenes</i> sp.	" "	Predator on caterpillars.
1934. * <i>Zethuscus</i> sp.	" "	Predator on caterpillars.
1935. * <i>Cissites auriculata</i> Champion.	" "	Parasite on <i>Xylocopa varipuncta</i> .
1936. * <i>Harmomia arcuata</i> (Fab.).	From Guam.	Predator on <i>Aphis</i> .
1936. <i>Cryptogonus nigripennis</i> Weise.	" "	Predator on <i>Pinus</i> <i>naspis burxi</i> .
1938. <i>Eupristina verticillata</i> Waterston.	From Philippines & Hong Kong.	Figwasp on <i>Ficus retusa</i> .
(1916. <i>Tiphia segregata</i> Crawford.	From Philippines.	Parasite of <i>Anomala</i> grubs.

In 1937 it was first known that this wasp had become established.)

List supplied by D. T. Fullaway of the Board of Agriculture and Forestry of Hawaii. Includes the introductions by the U. S. Bureau of Entomology fruit fly laboratory.

1929. <i>Sympherobius barberi</i> Bks.	Mexico	Established
" <i>Aenasius advena</i> Compere	"	Par. <i>Pseudococcus virgatus</i> . Established
1930. *Hemerobiid		
" <i>Diomus margipallens</i> (Muls.)	"	Established
" <i>Nephus bilucernarius</i> Muls.	"	
" <i>Scymnus pictus</i> Gorh.	"	Established
" *Red <i>Hyperaspis</i>	Panama	
" *Coccinellid—light brown	"	
" *6-spotted <i>Hyperaspis</i>	"	
" *Cecidomyid—large	Mexico	
" * <i>Phanurus</i>	"	Par. <i>Pseudococcus</i>
" * <i>Pseudaphycus</i>	"	"
" * <i>Midas pygmaeus</i>	California	Coccid predator
" * <i>Coccophagus gurneyi</i>	"	"
1931. * <i>Thripoctenus vinctus</i> Gahan	Philippines	Thrips parasite

"	* <i>Allothropa</i> sp.	Panama	Par. <i>Pseudococcus</i>
"	* <i>Cleothera</i> sp.	"	" "
"	* <i>Cecidomyid</i>	"	" "
"	* <i>Diomus</i> sp.	"	" "
"	* <i>Aenasius</i> sp.	"	" "
1932.	<i>Bufo marinus</i>	Puerto Rico	Established
1934.	<i>Catolaccus hunteri</i> Cwfd.	Guatemala	Par. pepper weevil
"	<i>Eupelmus cushmani</i> (Cwfd.)	"	Established
"	* <i>Eurytoma</i> sp.	"	Par. pepper weevil
"	* <i>Urosigalphus schwarzi</i> Cwfd.	"	Established
"	* <i>Aphycus clauseni</i> Timb.	California	Par. <i>Eriococcus</i>
1936.	* <i>Opus cereus</i> Gahan	Brazil	Par. fruit-fly
"	* <i>Opus bellus</i> Gahan	"	" "
"	* <i>Staphylinids</i>	"	" "
"	* <i>Pentilia egena</i>	"	diaspine coccid
"	* <i>Ladoria desarmata</i>	"	predator
"	* <i>Opus persulcatus</i>	East Indies	diaspine coccid
"	* <i>Opus longicaudatus</i>	" "	predator
"	* <i>Dirhinus</i> sp.	" "	Par. fruit-fly
"	* <i>Spalangia</i> sp.	" "	" "
"	* <i>Opus perproximus</i> (Silv.)	West Africa	" "
"	* <i>Opus caudatus</i> (Szep.)	" "	" "
"	* <i>Hedylus giffardii</i> (Silv.)	" "	" "
"	* <i>Opus</i> sp. (black)	" "	" "
"	* <i>Opus</i> sp. (red)	" "	" "
"	* <i>Opus</i> sp. (short ovipositor, large head)	" "	" "
"	* <i>Tetrastichus</i> sp.	" "	" "
"	* <i>Opus</i> sp. (black, long oviposi- tor)	" "	" "
"	* <i>Opus</i> sp. (black, stout)	" "	" "
"	* <i>Hedylus</i> sp. (large, yellow)	" "	" "
"	* <i>Opus crawfordi</i> (Vier.)	Mexico	" "
"	* <i>Opus anastrepha</i> (Vier.)	Puerto Rico	" "
1937.	* <i>Macrocentrus ancylivora</i> Rohw.	New Jersey	Par. Lepidoptera
"	* <i>Glypta rufiscutellaris</i> Cresson	" "	" "
1938.	<i>Cyrtorhinus fulvus</i> Knight	Philippines	Pred. <i>Megamelus proserpina</i>
"	* <i>Paranagrus</i> sp.	"	Established
"	* <i>Ootetrastichus</i> sp.	"	Par. <i>Megamelus proserpina</i>
"	<i>Eupristina verticillata</i> Waterst.	P. I. & Hong Kong	Par. <i>Megamelus proserpina</i>
"	* <i>Comperiella bifasciata</i> How.	P. I. & Japan	<i>Ficus retusa</i> fig
"	* <i>Coccidophilus citricola</i> Brethes	California	wasp. Estab- lished 1938
"	* <i>Syntomosphyrum indicum</i> Silv.	Fiji	Diaspine coccid
"	* <i>Cryptognatha nodiceps</i> Mshl.	"	predator

These earlier introductions were recently found established.

1909.	<i>Sphaeridium scarabaeoides</i> (Linn.)	Europe	Found established	1937
1923.	<i>Copris incertus</i> var. <i>prociuus</i>	Say Mexico	"	1928
1923.	<i>Onthophagus incensus</i>	Say Mexico	"	1934
1923.	<i>Apanteles glomeratus</i> (Linn.)	Japan	"	1934

LIST OF NATURAL ENEMIES OF PINEAPPLE PESTS IMPORTED AND LIBERATED
BY THE EXPERIMENT STATION OF THE PINEAPPLE PRODUCERS COOPERATIVE
ASSOCIATION DURING THE PERIOD 1930-1938
Supplied by K. Sakimura

Year	Species	Source	Host
1930	<i>Lobidiplosis pseudococci</i> Felt	Mexico	<i>Pseudococcus brevipes</i> , predator
1930 } 1931 }	* <i>Thripoctenus russelli</i> Crfd.	California	<i>Thrips tabaci</i> , parasite
1932	* <i>Zaplatycerus fullawayi</i> Timb.	Panama	<i>Pseudococcus brevipes</i> , parasite
1932 } 1933 } 1934 }	<i>Thripoctenus brui</i> Vuillet	Japan	<i>Thrips tabaci</i> , parasite
1931 } 1932 } 1933 } 1934 } 1935 } 1936 } 1937 }	* <i>Pseudistala nebulosa</i> Coq.	{ Panama British Guiana Guatemala Trinidad }	<i>Pseudococcus brevipes</i> , predator
1933	<i>Cryptolaemus montrou-</i> <i>zieri</i> Muls. (Experimental mass liberation)	California	<i>Pseudococcus brevipes</i> , predator
1935	* <i>Dicrodiplosis guatemal-</i> <i>ensis</i> Felt	Guatemala	<i>Pseudococcus brevipes</i> , predator
1935	* <i>Synaspidia pretiosa</i> (Timb.)	Guatemala	<i>Pseudococcus brevipes</i> , parasite
1935	* <i>Aenasius colombiensis</i> Comp.	Colombia	<i>Pseudococcus brevipes</i> , parasite
1935 } 1936 } 1937 }	<i>Anagyrus coccidivorus</i> Doz.	Brazil	<i>Pseudococcus brevipes</i> , parasite
1935 } 1936 } 1937 }	<i>Hambletonia pseudococ-</i> <i>cina</i> Comp.	{ Brazil Colombia Venezuela }	<i>Pseudococcus brevipes</i> , parasite
1936	* <i>Lithobius</i> sp.	Ohio	Symphylid, predator
1935 } 1936 }	* <i>Hyperaspis c-nigrum</i> Muls.	Brazil	<i>Pseudococcus brevipes</i> , predator
1936	* <i>A. coccinellid</i>	Brazil	<i>Pseudococcus brevipes</i> , predator
1936	* <i>Synaspidia</i> sp.	British Guiana	<i>Pseudococcus brevipes</i> , parasite
1937	* <i>Hyperaspis</i> sp.	Brazil	<i>Pseudococcus brevipes</i> , predator
1937	* <i>Diomus</i> sp.	Brazil	<i>Pseudococcus brevipes</i> , predator
1938	* <i>Scymnus apiciflavus</i> Motsch.	Malay	<i>Pseudococcus brevipes</i> , predator